

A REVISION OF FRANCIS WALKER'S TYPES OF NORTH AMERICAN EMPIDIDAE (DIPTERA)

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SYNOPSIS

Francis Walker's types of Nearctic Empididae are revised, and illustrated; redescrptions, new combinations and lectotype designations are given where necessary. Seven specific synonyms are newly established. One Jamaican species is included.

INTRODUCTION

WALKER described 42 Nearctic Empididae, 34 in his 'List of the specimens of Dipterous insects in the collection of the British Museum' (1848-1854) and a further 8 from W. W. Saunders' collections (Walker, 1852, 1857). These species have been variously interpreted by American workers, while some have remained unrecognized.

During a curatorial revision of the collection of Empididae in the British Museum (Natural History) (BMNH), types of 38 of Walker's species of Nearctic Empididae have been located. Since the recent Catalogue of Nearctic Diptera (Stone *et al.*, 1965) contains several errors of interpretation of Walker species, a revision of his types is given here and where necessary lectotypes are designated, new combinations made and new synonymy established. One Jamaican species (*Platypalpus bacis* Walker) previously misinterpreted is also included.

Certain genera such as *Rhamphomyia* have as yet received little critical attention in North America and it is possible that further new synonymy involving Walker species will eventually be established. However, adequate illustrated redescrptions are given here to render such synonymy obvious to future revisers of Nearctic Empididae.

The arrangement of subfamilies and genera follows that of the Nearctic Catalogue (Stone *et al.*, 1965). Within each genus, species are arranged in alphabetical order of Walker's names, irrespective of synonymy, except in the case where two Walker

names are involved, when the valid one is taken. For convenience, Walker's original binomina are indexed at the end of this paper, with their present equivalents and synonyms.

Detailed redescriptions are deliberately not given since future Nearctic revisers with fresh material will be better able to provide these. The types are available, but their generally poor condition precludes the possibility of a consistent standard of redescription. Where possible wing photographs, genitalia figures and brief redescriptions based on major characters, relevant to existing keys, are given. These are considered adequate for accurate identification by future revisers, but in some genera, especially where associated females are little known, the types may need further careful study. Where types are unlocated, Walker's descriptions are given for convenience since the original works are rare.

To avoid repetition, collectors and data labels present on the type-specimens dealt with in this paper are referred to only briefly in the text, but are explained fully below. Further notes on these collections and donors are given by C. O. Waterhouse (1902).

Abbot labels are rectangular, with 'Georgia' printed on them.

Barnston labels are circular with 'Huds. Bay' on one side and the accession number '47.4' on the other.

Doubleday labels are circular or rectangular with 'Trenton Doubleday' or 'N. York Doubleday' handwritten upon them.

Entomological Club specimens bear a printed label 'Ent. Club. 44-12'.

Gosse labels are circular with handwritten 'Jamaica' on one side and B.M. accession number 45.110 on the other.

Redman labels are usually diamond-shaped, with a handwritten 'R' upon them, or circular with 'Redman' on one side and 'Nova Scotia' on the other.

Saunders labels are circular or rectangular with 'U.S.' handwritten upon them.

Walker labels are rectangular folded strips, usually with just the specific (trivial) name handwritten.

Waterhouse labels are printed 'One of Walker's series so named', signed 'EAW' and with the name of the species neatly written by Waterhouse on the verso.

The green-margined Walker Type labels and printed locality and species names are not mentioned since these have been subsequently and sometimes arbitrarily attached. A lectotype label and a lectotype designation label have been added where necessary.

WALKER'S TYPES OF NORTH AMERICAN EMPIDIDAE

Subfamily **HYBOTINAE**

Hybos reversus Walker

(Pl. 1, fig. 1)

Hybos reversus Walker, 1848 : 487. [No sex given.] Holotype ♂, U.S.A.: New York, Trenton Falls (*E. Doubleday*).

The holotype was very mouldy, but has now been cleaned and is in quite good

condition, except that the distal half of the abdomen is missing. Doubleday and Waterhouse labels are present.

The wings (Pl. 1, fig. 1) are distinctly brownish on the distal two-thirds, a feature of the male sex in this species.

There seems little doubt that this species has been correctly interpreted in the literature and the type runs without difficulty to *H. reversus* in Melander's (1928) key to Nearctic *Hybos*.

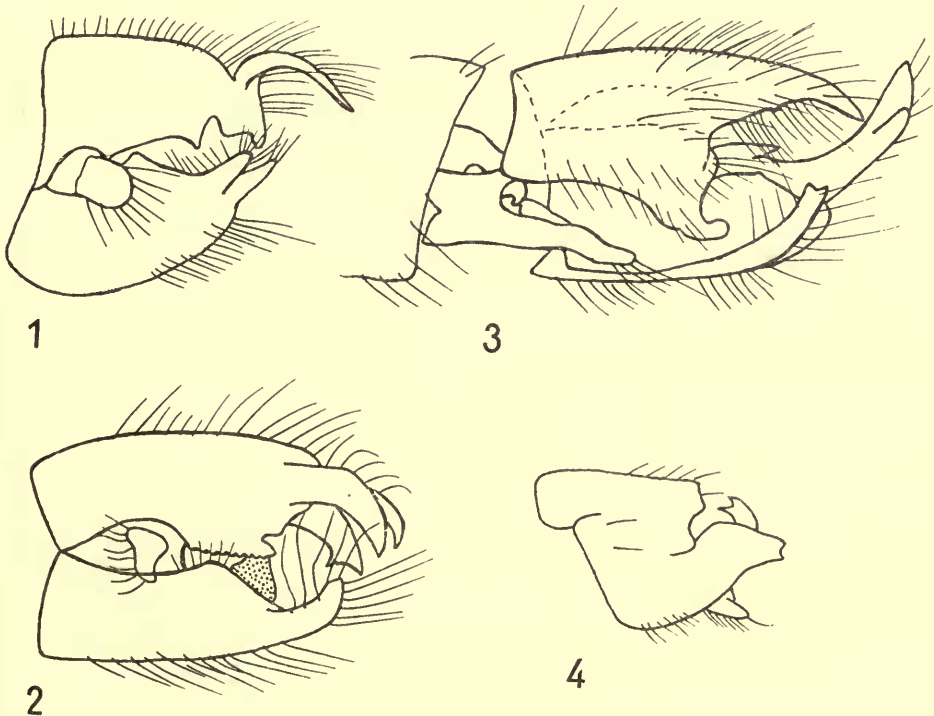
Euhybus duplex (Walker)

(Pl. 1, fig. 2; Text-fig. 1)

Hybos duplex Walker, 1848 : 486. Holotype ♂, U.S.A.: New York, Trenton Falls (*E. Doubleday*).

The holotype does not fit the interpretation given by Melander (1928) and is therefore redescribed. It bears a circular 'N. York, Doubleday' label and a Waterhouse label. The redescription includes only major characters of value for differentiating the species from others in the genus.

Thorax apparently without strong dorsocentrals, but pinned through this area. Wing (Pl. 1, fig. 2) brownish on basal half and stigma, greyish distally. Legs black with tarsi and knees yellowish. Front legs with pulvilli normal and basitarsus longer than second tarsal



FIGS 1-4. Male genitalia. 1, *Euhybus duplex*, holotype. 2, *E. subjectus*, lectotype. 3, *E. triplex*, holotype. 4, *Syneches phthia*, holotype.

segment. Hind femur strongly bristled, but without strong spinigerous tubercles and hind tibia not excavated or prominently margined. Hind basitarsus *with* 4 short strong anterior bristles. Genitalia as illustrated (Text-fig. 1).

Length: 3.5 mm.

***Euhybus purpureus* (Walker)**

(Pl. 1, fig. 3)

Hybos purpureus Walker, 1848 : 486. Holotype ♀, U.S.A.: Georgia (*Mr Abbot*).

Coquillett (1895) erected *Euhybus* to receive three Walker *Hybos* of which *H. purpureus* is the type-species (Coquillett, 1903).

The holotype ♀ is in fair condition and exhibits well the characters of the genus. An Abbot label is present. The species has the basal half of the wing brownish (Pl. 1, fig. 3) and appears to have been correctly interpreted in the literature.

***Euhybus subjectus* (Walker)**

(Pl. 1, fig. 4; Text-fig. 2)

Hybos subjectus Walker, 1848 : 487. [No sex given.] LECTOTYPE ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated.

There are three Walker specimens labelled as *subjectus*, a male, female, and a damaged specimen of uncertain sex. They appear conspecific, and all bear Barnston and Waterhouse labels. The male bears a green Walker label and is designated lectotype. It is in poor condition, lacking a head and three legs.

Thorax apparently without strong dorsocentrals, but the specimen is pinned through this area. Wing (Pl. 1, fig. 4) distinctly brown on a little more than basal half and greyish distally and without distinct stigma. Legs black with tarsi and knees yellowish. Front legs with pulvilli normal and basitarsus longer than second tarsal segment. Hind femur strongly bristled, but without strong spinigerous tubercles and hind tibia not excavated or prominently margined. Hind basitarsus *without* strong anterior bristles. Genitalia as illustrated (Text-fig. 2).

Length: *ca* 3 mm.

***Euhybus triplex* (Walker)**

(Text-fig. 3)

Hybos triplex Walker, 1849 : 486. Holotype ♂, U.S.A.: New York, Trenton (*E. Doubleday*).

The holotype male is in rather a crumpled state and mouldy, but appears to be correctly interpreted in the American literature. Doubleday and Waterhouse labels are present. The genitalia are illustrated (Text-fig. 3).

***Syneches bacis* (Walker) comb. n.**

(Pl. 1, fig. 5)

Platypalpus bacis Walker, 1849 : 510. [No sex given.] Holotype, sex uncertain, JAMAICA (*P. H. Gosse*).

This species, described in *Platypalpus*, was regarded as a *Tachypeza* by Bezzi (1905 : 460) and later placed in *Elaphropeza* (= *Ctenodrapetis*) by Bezzi (1909b) and

Melander (1910, 1928), where it was included in the Empididae section of the Catalogue of Neotropical Diptera (Smith, 1967). I have now located and examined the holotype and it is a *Syneches*, bearing Gosse and Waterhouse labels. Only one *Syneches* has been recorded from Jamaica, *S. inversus* Curran (1928), but this is a larger darker species. The species appears to be distinct from any other Nearctic and Neotropical species and, although damaged, sufficient remains for a future reviser of the genus to work on. Since existing keys give mostly colour characters, the following brief description should suffice to indicate its approximate taxonomic position, which from the keys of Melander (1902) and Smith (1962) would appear to be near *S. debilis* Coquillett or *S. luteus* (Wiedemann).

Basal antennal segments yellowish, third segment and arista brownish. Proboscis and palpi yellowish. Thorax completely reddish yellow. Abdomen missing but Walker described this as 'piceous above'. The legs are completely yellow, except for the hind tibia, which is brownish at tip. The wing is clear (Pl. 1, fig. 5) with a well-defined oval stigma. Halteres broken off.

Length: ca 3.5 mm.

There is a *Sphaerophoria* sp. on the same pin, presumably taken as prey.

Syneches phthia (Walker)

(Pl. 1, fig. 6; Text-fig. 4)

Gloma phthia Walker, 1849 : 492. Holotype ♂, U.S.A.: New York, Trenton Falls (*E. Doubleday*).

The holotype male is badly damaged and bears a Doubleday label, a Waterhouse label and a pencil ms label 'Syneches S.W.W.', the last being by Professor S. W. Williston. As I have indicated elsewhere (Smith, 1962) this specimen is not conspecific with *simplex* Walker, the type-species of *Syneches* Walker (1852 : 165) (see under *simplex*, below), as can be seen from the description and illustrations given here.

Melander (1928 : 39) states 'This insect was previously described as *Gloma phthia*, according to Dr. Williston who examined Walker's type. The enigmatical cross-veins in the description of *phthia* refer to the two stigmal markings'. Actually Walker's comments were given as a note after the description as follows.

'Note.—The wings of this species have two crossveins, which do not appear in the wings of *G. fuscipennis*, and the fork of the vein at the tip is missing.'

The only explanation I can offer for these comments is that the veins closing the discal and anal cells, being more vertical in the *Syneches* wing, were referred to as cross-veins by Walker.

Head missing. Thorax and abdomen dull brown with pale hairs, genitalia as illustrated (Text-fig. 4). Wings (Pl. 1, fig. 6) greyish with brown stigma. Halteres dark. Legs missing except for one hind leg, in which the femur and tibia are brown and the tarsus yellow.

Syneches simplex Walker

(Pl. 1, fig. 7)

Syneches simplex Walker, 1852 : 165. ♂, 'United States' (*W. W. Saunders*).

The type of this species appears to be lost and since this is the type-species of the genus, I repeat Walker's description here and figure the wing (Pl. 1, fig. 7) of a recent

American specimen. The species is quite distinct from *phthia*, with which it has previously been synonymized as discussed under that species, but has otherwise been correctly interpreted in the literature.

'SYNECHES, n. g.

'Antennis articuli breves; 3us 2o multo latior vix longior; seta capite vix brevior articulis 1o ad 3um triplo longior; alae costa incisa; areolae undecim, duo marginales, una submarginalis, una apicalis, duo posteriores, una inferior, tres basales, una discoidalis.

'Joints of the feelers short; third joint nearly round, much broader but hardly longer than the second joint; bristle very slender, about thrice the length of all the preceding joints, nearly as long as the head: chest gibbous: fore border of the wing slightly notched towards the brand: two marginal areolets, one submarginal, one apical, two posterior, one inferior, three basal, and one discoidal.

'SYNECHES SIMPLEX, Mas, Plate 5, fig. 7

'*Fusca, thorace vittis indistinctis fulvis ornato, abdomine nigro, antennis pedibusque fulvis, alis cinereis fusco flavoque variis.*

'Body dark brown, clothed with black hairs: eyes red, meeting above; facets large: mouth and feelers tawny; bristle of the feeler black: chest adorned with tawny stripes which are nearly confluent: abdomen linear, rather flat, black, longer and much narrower than the chest; tip dark tawny, shining: legs tawny; thighs and fore-shanks partly pitchy: wings pale gray, brownish on the borders of the cross-veins and beneath the brand, which is dark brown; the wing is yellow on each side of the latter, and there is a dark brown spot beyond it; wing-ribs and veins brown; poisers large, tawny. Length of the body $1\frac{1}{2}$ line; of the wings 3 lines.

'United States.'

Subfamily OCYDROMIINAE

Ocydromia peregrinata Walker

(Pl. I, fig. 10)

Ocydromia peregrinata Walker, 1849 : 488. [No sex given.] Holotype ♀, U.S.A.: New York, Trenton Falls (*E. Doubleday*).

The type female is in poor condition, but appears conspecific with *O. glabricula* (Fallén) as interpreted by North American authors. Doubleday and Waterhouse labels are present. The wing is illustrated (Pl. I, fig. 10).

Bicellaria drapetoides (Walker) comb. n.

(Pl. I, fig. 8; Text-fig. 5)

Microphorus drapetoides Walker, 1849 : 489. LECTOTYPE ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated.

Melander (1928 : 105, 1940 : 5) suggested that *Microphorus drapetoides* Walker possibly belonged to *Anthepiscopus*. In the recent catalogue of North American Diptera (Stone *et al.*, 1965 : 453) it is referred under *Microphorus* as unrecognized.

In the BMNH are two males, one of which bears a label 'Dolichopus nob. holosericeus' and the other bears a label 'Hybos niger or drapetoides' and a Barnston label. Both are *Bicellaria* and the latter specimen is designated as lectotype.

The lectotype lacks hind legs and most of the thorax is destroyed by the pin, and will not therefore run out in Melander's key (1928 : 74). It is a blackish species with faintly infumated wings (Pl. 1, fig. 8), black halteres, and male genitalia as illustrated (Text-fig. 5).

Bicellaria expulsa (Walker) **comb. n.**

Rhamphomyia expulsa Walker, 1857 : 148. Holotype ♂, 'United States' (*W. W. Saunders*).

The holotype male is crushed into gum and the whole specimen will have to be floated off and mounted in fragments for study. I feel that this is best left to some future reviser of the genus and the genitalia are not therefore illustrated. Walker and Saunders labels are present.

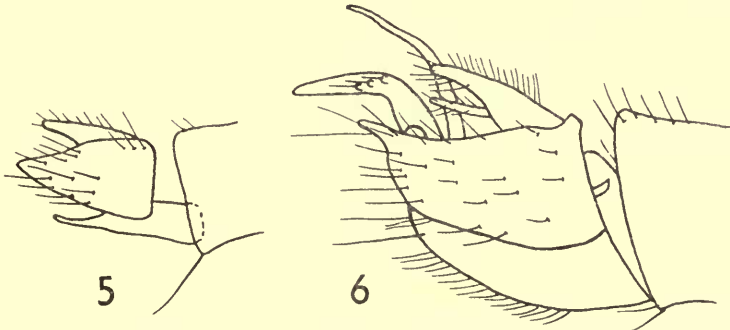
It is not possible to say if this species is synonymous with any of the other described Nearctic species until the genus is properly revised and good illustrations of the male genitalia made available.

Since there was nothing to indicate otherwise in Walker's very brief and inadequate description, this species was included as described, in the Nearctic catalogue, under *Rhamphomyia*. The holotype is in a poor condition, but the following characters are visible and indicate its relationships within *Bicellaria* as indicated in Melander's (1928) key.

♂ Body and legs black; arista as long as third antennal segment; thorax black, unstriped and shorter haired in front; hind tibiae dark haired and thickened towards apex and hind basitarsi slightly thickened. Bristling of hind legs not clear. Wings pale brownish, halteres broken off.

Subfamily **EMPIDINAE**

In the genera *Empis* and *Rhamphomyia*, European authors, particularly Frey (1922) and Bezzi (1909a), have erected many subgenera. Some of these may not be valid on a world basis and as yet no attempt has been made to subdivide these genera



FIGS 5-6. Male genitalia. 5, *Bicellaria drapetoides*, lectotype. 6, *Itaphila transfuga*, lectotype.

in the Nearctic Region. Steyskal (in Stone *et al.*, 1965 : 458) suggests some new subgenera may be needed for some Nearctic species and that of the existing subgenera of *Empis*, *Empis* s.s., *Pachymeria* Stephens, *Platyptera* Meigen and *Argyrandrus* Bezzi are unlikely to be represented in the North American fauna.

In the present paper very few species fit comfortably into existing subgenera and for this reason only obvious subgeneric assignments are suggested.

Iteaphila cormus (Walker)

(Pl. I, fig. 9)

Empis cormus Walker, 1849 : 496. LECTOTYPE ♀, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated.

Iteaphila cormus (Walker); Melander, 1928 : 103; 1946 : 32 (key), 34.

There are four females in Walker's series, all with Barnston and Waterhouse labels. I have designated as lectotype the one in the best condition. The species is very close to *I. macquarti* Zetterstedt and *I. cana* Melander, but appears to be distinct on the character of the subshining frons.

♀ Frons subshining, lightly dusted. The proboscis is a little shorter than the head height; there are ten scutellar bristles and while the body hairs are pale, the bristles are black. The wing is illustrated (Pl. I, fig. 9)

Length: 4 mm.

Also standing over the *cormus* label were two males and a headless female without data. The males are *I. macquarti*. Although Walker included both sexes in his original description I am reluctant to regard these three specimens as part of the type-series.

Iteaphila migrata (Walker) **comb. n.**

Hilara migrata Walker, 1848 : 491. Holotype ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*).

Iteaphila americana Melander, 1946 : 32. Holotype ♂, U.S.A.: Wyoming, Thumb of Yellowstone Lake, 16.vii.1923 (*A. L. Melander*). In USNM, Washington. **Syn. n.**

The holotype of *migrata* bears Barnston and Waterhouse labels.

Melander's description of *americana* agrees well with Walker's holotype, though the acrostichals are short rather than minute. The genitalia are very distinctive and are figured by Melander. Through the kindness of Dr Lloyd Knutson I have also compared Melander's paratypes with Walker's type.

Tuomikoski (1958) synonymises *I. americana* with *I. nitidula* Zetterstedt, 1849, which would take priority over Walker's name. I have not seen Zetterstedt's type.

Iteaphila macquarti Zetterstedt

(Text-fig. 6)

Iteaphila macquarti Zetterstedt, 1838 : 541. Syntypes ♂♀, Swedish and Norwegian Lapland, many localities (*J. W. Zetterstedt & D. Boheman*). In Lund and Stockholm.

Hilara transfuga Walker, 1848 : 491. [♀]. LECTOTYPE ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated. **Syn. n.**

There are two damaged specimens and a male in fair condition labelled as *transfuga* in Walker's series. All have Barnston and Waterhouse labels. The species is clearly synonymous with *I. macquarti* Zetterstedt (1838), the type-species of the genus, whose name has priority (see Tuomikoski, 1958). The male genitalia are illustrated (Text-fig. 6).

Hilara plebeia Walker

Hilara plebeia Walker, 1857 : 148. ♀, 'United States' (*W. W. Saunders*).

I have been unable to find this type and Walker's description is therefore repeated here.

'Foem.—Nigra, pedibus anticis ferrugineis, alis limpidis, venis stigmatique nigris, halteribus fulvis.

'Female.—Black; fore legs ferruginous; wings limpid, veins and stigma black; halteres tawny.

'Length of the body 1½ line; of the wings 3 lines.'

Empis abcirus Walker

(Pl. 2, fig. 1; Text-fig. 7)

Empis abcirus Walker, 1849 : 494. Holotype ♂, U.S.A.: Georgia (*Mr Abbot*).

The holotype male is in very good condition, and bears Waterston and Abbot labels; it is referable to the subgenus *Polyblepharis* Bezzi and is closely related to *E. eudamides* Walker (see below), differing only as follows.

♂ Thorax black, heavily dusted light greyish, not yellow at sides or on humeri and postalar calli. Acrostichals distinctly biserial, dorsocentrals bi-triserial ending stronger and uniserial. Scutellum concolorous with thorax without yellowish margin. Abdomen similarly shining blackish with genitalia (Text-fig. 7) differing as illustrated. Wings (Pl. 2, fig. 1) greyish, a little shorter than in *E. eudamides*. Legs similarly bristled but femoral bristles a little shorter.

Length: 5 mm.

Empis agasthus Walker

(Pl. 2, fig. 2)

Empis agasthus Walker, 1849 : 496. LECTOTYPE ♀, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated.

Rhamphomyia ficana Walker, 1849 : 501. LECTOTYPE ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated. **Syn. n.**

There are four females standing over this name mounted in 2 pairs, each pair impaled on the same pin. One pair is labelled *agasthus* and bears a Barnston label. The upper of these two specimens being the more perfect, it is here designated lectotype. The second pair of specimens is labelled 'Empis albipes' without other data and is conspecific. All the specimens are clumsily impaled on large pins and are very dirty.

The two syntype females labelled *Rhamphomyia ficana* bear the same data, are mounted similarly and are clearly synonymous. The upper specimen is designated lectotype.

In Melander's (1902) key all these females run to *varipes* Loew and compare fairly closely with the description and specimens of this species as can be seen from the following redescription. However, without a more thorough knowledge of the females of the Nearctic species in this group I am reluctant to synonymize them formally.

♀ Head black, dusted greyish. Proboscis a little longer than head. Antennae with basal segments dark brownish, third segment blackish.

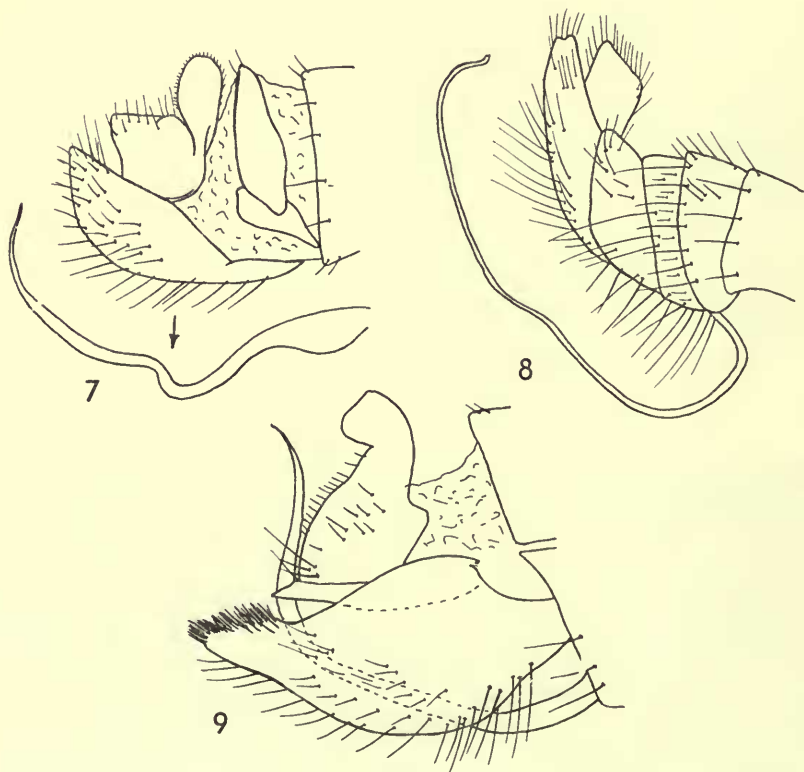
Thorax black, dusted greyish with 3 black stripes in acrostichal and dorsocentral positions. Acrostichal bristles apparently absent, dorsocentral bristles uniserial.

Abdomen shining dark brown with short sparse pale hairs.

Wings (Pl. 2, fig. 2) pale with pale veins. Halteres yellow.

Legs front coxae yellowish, middle and hind coxae blackish, dusted greyish; front femora yellowish, middle and hind femora with broad dark ring; tibiae yellowish with dark tips; tarsal segments somewhat darker apically. Front femora with short stout bristles distally; middle and hind femora with short stout bristles on more than distal half. Hind femora distinctly curved posteriorly when viewed from above.

Length: 3 mm.



FIGS 7-9. Male genitalia. 7, *Empis abcirus*, holotype. 8, *E. colonica*, holotype. 9, *E. eudamides*, holotype.

Empis amytis Walker

(Pl. 2, fig. 3)

Empis amytis Walker, 1849 : 493. Holotype ♂, U.S.A.: New York (*Entomological Club*).

The holotype male is in poor condition, lacking antennae, some legs and most bristles, but it keys out readily to *amytis* in Melander's (1902) key. A Waterhouse label, a handwritten Doubleday label and a further handwritten label 'Apparently insect referred to by Walker presented by E. Doubleday not Ent. Club. E. A. W[aterhouse]. 31.3.00' are present.

♂ Head black, dusted greyish. Proboscis reddish yellow, longer than head. Thorax deep black on disc, yellow at sides including humeri and postalar calli. Scutellum and pleurae reddish yellow. Abdomen black on disc, reddish yellow at sides and below, tip missing. Wings (Pl. 2, fig. 3) clear with faint stigma. Halteres yellowish. Legs yellow and weakly bristled.

Length: *ca* 5 mm.

Empis colonica Walker

(Text-fig. 8)

Empis colonica Walker, 1849 : 498. Holotype ♂, CANADA: Nova Scotia (*Lieut. Redman*).*Empis rufescens* Loew, 1864 : 76. Holotype ♂, U.S.A.: New Hampshire (*C. R. Osten-Sacken*).

In USNM, Washington. **Syn. n.**

The holotype male is in good condition except for the missing front legs, and obviously belongs to the subgenus *Xanthempis*, although the axillary angle of the wing is acute. Waterhouse and Redman labels are present. In Melander's (1902) key the species runs to couplet 20, containing *armipes* Loew and *colonica* Walker, if one regards the occiput as yellow; otherwise, with a dark occiput the species runs to *rufescens* Loew. The genitalia of Walker's type closely resemble Melander's figure of *rufescens* Loew.

The following redescription stresses the major characters given in the descriptions of the species mentioned above.

♂ Head blackish, only narrowly yellow about neck, dusted greyish. Eyes narrowly separated, by less than ocellar width at middle. First and second antennal segments dirty yellowish, third segment blackish. Proboscis yellow, about 3 times as long as head is deep. Palpi yellow.

Thorax yellow, dulled by dust on disc, subshining laterally; acrostichal bristles absent, dorsocentrals uniseriate. Scutellum and pleurae yellow.

Abdomen brownish yellow, short black haired, with long slender hindmarginal bristles. Genitalia as illustrated (Text-fig. 8).

Wings clear, stigma faint. Halteres yellow.

Legs yellow, front legs missing, except for one femur which lacks strong bristles. Middle femur with short anterior, antero- and posteroventral bristles; hind femur with 2 weak antero-dorsal bristles distally and series of anterior, antero- and posterodorsals and posterior bristles. Middle tibia with weak antero- and posteroventrals, stronger antero- and posterodorsals; hind tibia with weak anterodorsals becoming stronger distally, stronger antero- and posterodorsals. Tarsi of middle and hind legs yellowish, darker distally.

I have compared Walker's type with specimens sent by Dr L. Knutson and find them to be conspecific with *Empis rufescens* Loew (1864).

Empis eudamides Walker

(Text-fig. 9)

Empis eudamides Walker, 1849 : 493. Holotype ♂, 'North America' (*Entomological Club*).

The holotype male is in quite good condition and is referable to the subgenus *Polyblepharis* Bezzi. Waterhouse and 'Ent. Club' labels are present. The species runs out to the correct couplet (15) in Melander's (1902) key but is separated from *abcirus* Walker as having the tip of the femora black. In fact both species are very narrowly black at the tip, but not sufficiently to warrant the description 'knees black' used by Walker for *eudamides*. The two species are distinct, however, as is indicated by the redescription given below.

♂ Head black, dusted greyish, eyes broadly separated. First and second antennal segments and third segment at extreme base yellow, remainder black. Proboscis yellowish brown, about twice as long as head is deep.

Thorax black, dusted greyish with two narrow black stripes each side of the acrostichal row and two broader black lateral stripes. Humeri, sides of thorax and postalar calli yellow. Acrostichal bristles irregularly bi-quadriseiral, dorsocentral bristles biserial ending longer and uniserial. Scutellum black on disc with yellowish margin and 4 marginal bristles. Pleurae largely blackish, dusted greyish with propleuron and metapleuron largely reddish yellow.

Abdomen shining blackish, short dark-haired with longer black bristly hairs laterally. Genitalia (Text-fig. 9) yellowish.

Wings clear with dark veins and faint stigma. Halteres yellow.

Legs with coxae all dark. Femora yellow, but front and middle femora with broad dark dorsal patch about middle; tibiae and tarsi yellow. Front legs weakly bristled, middle and hind femora with black anteroventral and posteroventral bristles, middle tibia with anterodorsals, hind tibia with antero- and posterodorsals.

Length: 7 mm.

Empis olli Walker

(Pl. 2, fig. 4)

Empis olli Walker, 1849 : 493. Holotype ♀, CANADA: Nova Scotia (*Lieut. Redman*).

The holotype female lacks a head, but is otherwise in good condition and is clearly very similar to *eudamides* Walker and *abcirus* Walker and may well prove to be conspecific with one of them when both sexes of these species are found in association. Waterhouse and circular Redman labels are present.

Head missing. Thorax completely greyish dusted, except for two narrow black stripes, one each side of acrostichal bristles and a broader less distinct lateral stripe. Pleurae and scutellum concolorous with thorax. Abdomen dark brown, shining with short dark hairs and longer marginal and lateral bristly hairs. Wings (Pl. 2, fig. 4) faintly brownish. Halteres yellow. Legs with coxae dark, dusted greyish, otherwise yellowish except for darkened last two tarsal segments; hind femora with weak anteroventrals, otherwise femora unarmed. Front tibiae with weak anterodorsal bristles, middle and hind tibiae with distinct antero- and posterodorsal bristles.

Length: ca 4 mm.

Empis reciproca Walker

(Pl. 2, fig. 5)

Empis reciproca Walker, 1857 : 147. Holotype ♀, 'United States' (*W. W. Saunders*).

The holotype female is in good condition apart from missing third antennal segments. Walker and Waterhouse labels are present. In Melander's (1902) key the species runs to *ravida* Coquillett, but appears to be distinct from that species as the following redescription shows.

♀ A pale yellowish grey species. Head completely and heavily dusted grey. First and second antennal segments brownish, third segment missing. Proboscis nearly twice as long as head is deep. Palpi yellow.

Thorax heavily dusted greyish with two narrow dark stripes, one each side of centre and two broader outer stripes. Acrostichal bristles absent; dorsocentrals uniserial. Scutellum dusted greyish, with yellowish corners and 8 marginal bristles comprised of 2 strong pairs and 2 weak pairs. Pleurae completely greyish dusted.

Abdomen completely dusted yellowish grey, with short sparse dark hairs above, longer at sides.

Wings (Pl. 2, fig. 5) faintly brownish tinged, with faint stigma. Halteres yellow.

Legs, including coxae, yellow. Front femora with weak hair-like anteroventrals, middle femora with antero- and posteroventrals, hind femora with some distinct anteroventrals distally, otherwise bristles long and hair-like. Tibiae with rather long bristles and hairs above. First two tarsal segments brownish distally, remaining segments brownish.

Length: 5 mm.

Rhamphomyia agasicles Walker

(Pl. 2, fig. 6)

Rhamphomyia agasicles Walker, 1849 : 499. LECTOTYPE ♀, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated.

Walker gives a size-range for this species, suggesting that he had more than one specimen before him. There is only one specimen, a female, present in the collection, which I designate as lectotype. Only a Waterhouse label is present.

In Coquillett's (1895) key this species runs to *angustipennis* Loew if one interprets the wings as being pale basally; otherwise the species runs to *polita* Loew. The following brief redescription indicates its distinctions from both the species mentioned.

A shining blackish species, frons, thoracic disc, abdomen and legs all shining. Wings (Pl. 2, fig. 6) brownish, somewhat paler at base, especially if viewed with the naked eye; rather broad; anal vein indistinct on distal third. Halteres yellow. Legs without pennate hairs.

Length: 3.5 mm.

Rhamphomyia cophas Walker

(Pl. 2, fig. 7)

Rhamphomyia cophas Walker, 1848 : 499. [No sex given.] Holotype ♀, U.S.A.: New York (*Entomological Club*).

The holotype female is very greasy and badly damaged with the abdomen and most

of the legs missing. Waterhouse and Doubleday labels are present, together with a handwritten label 'Walker's measurements in error. E. A. W[aterhouse]. 3.3.00'.

The acrostichal bristles are biserial, the dorsocentrals uniserial. One middle and one hind leg are intact and neither has pennate hairs. The femora are dark brown, the tibiae more yellowish. The middle tibia has some short antero- and posteroventral bristles and some longer antero- and posterodorsal bristles; the front and middle basitarsi have short antero- and posteroventral bristles. The wing (Pl. 2, fig. 7) is greyish and the halteres are yellow.

Length: *ca* 5-6 mm.

Rhamphomyia dana Walker

(Pl. 2, fig. 8)

Rhamphomyia dana Walker, 1849 : 502. Holotype ♀, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*).

The holotype ♀ is in quite good condition and belongs to the subgenus *Pararhamphomyia*. Only a Waterhouse label is present. In Coquillett's (1895) key this species runs to *abdita* Coquillett, but differs in having no pennate hairs on the front legs. The following description of the major features should help a future reviser.

Colour pale brownish, probably darker in life. Antennal style about one quarter the length of third antennal segment. Thorax dulled by dust, with 3 indistinct dark lines under the rows of bristles, acrostichals biserial, dorsocentrals uniserial. Abdomen paler than rest of body and dark-haired. Wing as illustrated (Pl. 2, fig. 8), halteres yellow. No pennate hairs on the front legs, but middle and hind femora and tibiae with pennate hairs above and below, those of hind legs particularly long. All tarsi without pennate hairs.

Length: 3.5 mm.

Rhamphomyia daria Walker

(Pl. 2, figs 9, 10; Text-fig. 10)

Rhamphomyia daria Walker, 1849 : 503. Holotype ♂, U.S.A.: New York (*E. Doubleday*).

Rhamphomyia gracilis Loew, 1861 : 329. Syntypes ♂ ♀, U.S.A.: Pennsylvania (*C. R. Osten-Sacken*). In USNM, Washington. **Syn. n.**

Rhamphomyia bipunctata Curran, 1930 : 47.

The holotype male is in good condition apart from a few strands of mould and bears Doubleday and Waterhouse labels. In Coquillett's (1895) key the species runs straight out to *gracilis* Loew with which it is obviously synonymous. As this species has already been described three times no redescription is given here, but it is easily distinguished by its yellow coxae and femora, shining thorax and abdomen and the female wing markings. The male genitalia (Text-fig. 10) and wings (Pl. 2, figs 9 & 10) (of specimens compared with the type) are illustrated.

Rhamphomyia ecetra Walker

(Pl. 3, fig. 1)

Rhamphomyia ecetra Walker, 1849 : 500. [♂ error.] Holotype ♀, U.S.A.: Georgia (*Mr Abbot*).

The holotype female has only the femora of the hind legs present and the knobs of both halteres missing so that it will not run out satisfactorily in Coquillett's (1895)

key. It appears close to *sudigeronis* Coquillett as the brief redescription below indicates. Only a Waterhouse label is present.

Head and thorax including pleurae black, dusted light greyish. Acrostichals irregularly bi-triserial; dorsocentrals pluriserial, ending stronger uniserial. Scutellum with 6 marginal bristles. Abdomen dark brown, dusted dorsally, but subshining laterally. Wings (Pl. 3, fig. 1) uniformly brownish. Halteres with yellow stem, knobs broken off. Legs dark brown; front tibiae and basitarsi pennate above, middle femora and tibiae pennate above and below, middle basitarsi pennate above; hind femora pennate above and below, tibiae and tarsi missing.

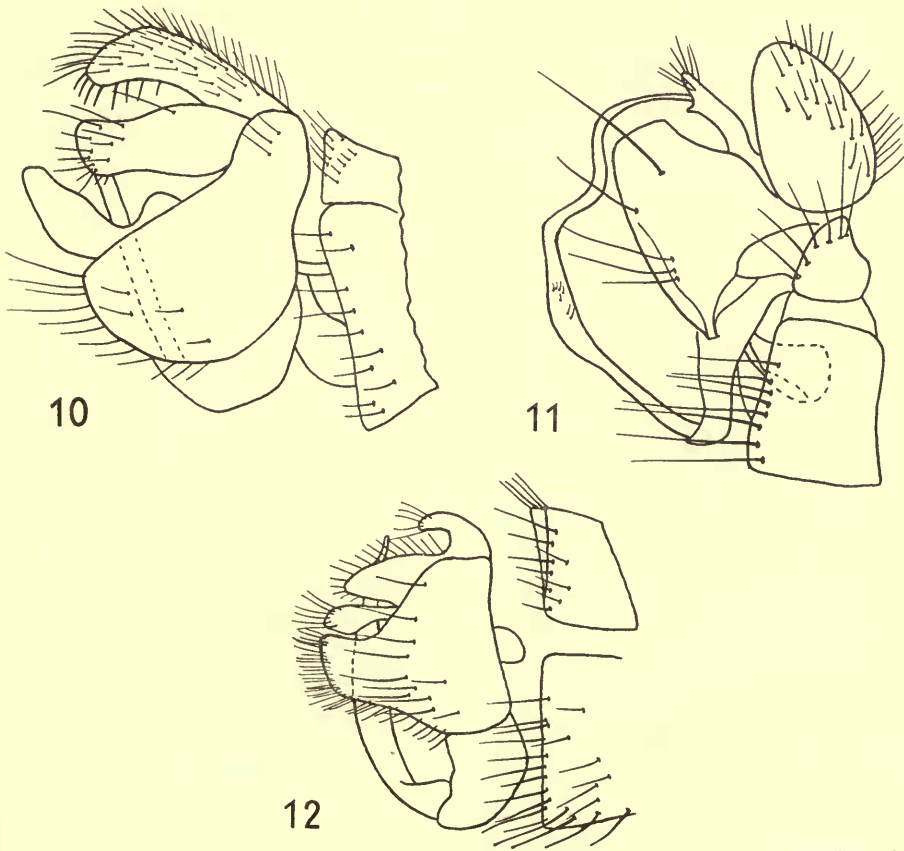
Length: 4 mm.

Rhamphomyia flavirostris Walker

(Text-fig. 11)

Rhamphomyia flavirostris Walker, 1849 : 501. LECTOTYPE ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated.

There are two specimens (♂, ♀) standing over this name and I designate the male as lectotype. Barnston and Waterhouse labels are present on both specimens.



FIGS 10-12. Male genitalia. 10, *Rhamphomyia darvia*, holotype. 11, *R. flavirostris*, lectotype. 12, *R. phemius* (= *anaxo*), lectotype.

Both appear referable to *Pararhamphomyia*, but the anal vein of the female is complete.

The male keys to *leucoptera* Loew in Coquillett's (1895) key, but is a little larger. The female runs to couplet 41, where it is eliminated by having a normal discal cell, yet silvery pollinose abdomen.

The following redescriptions include only the major taxonomic characters.

♂ Eyes touching. Head and thorax black, dusted greyish with black bristles and hairs. Abdomen brownish, dark haired, with longer pale hairs at sides. Genitalia as illustrated (Text-fig. 11). Wings clear with yellowish veins, discal cell shorter than middle vein issuing from its end. Anal vein fading away about half way from wing-margin. Legs yellowish, possibly darker in life (Walker says tawny).

Length: 5 mm.

♀ Similar to male, but abdomen shorter and coarser haired and silvery tomentose in shifting light. Legs without pennate hairs.

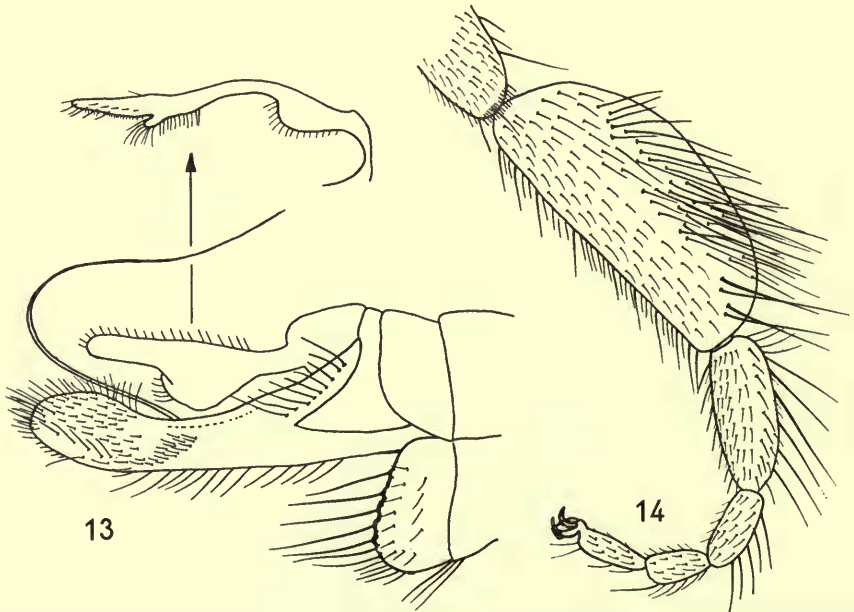
Rhamphomyia mallos Walker

(Pl. 3, fig. 2)

Rhamphomyia mallos Walker, 1849 : 502. Holotype ♀, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*).

The holotype female is in fair condition and bears Barnston and Waterhouse labels.

Although the anal vein is distinct to the wing-margin it is somewhat paler about the middle. The prothoracic episternum is bare and the sides of the sternum have



FIGS 13-14. *Rhamphomyia minytus*, holotype. 13, male genitalia. 14, male right hind tarsus in posterior view.

3 bristly hairs. This combination of characters places the species in the subgenus *Pararhamphomyia*.

Coquillett's (1895) interpretation of the species does not appear to be correct. The species is of the *basalis*-group and appears to be close to *valga* Coquillett, but the hind metatarsus is not pennate above (see Chilcott, 1959). The following diagnostic points should help a future reviser of the genus.

♀ Third antennal segment less than twice as long as broad. Thorax pale grey pollinose with 3 narrow brown stripes under the line of bristles, acrostichals biserial, dorsocentrals irregularly biserial to uniserial, biserial about middle. Abdomen with brown pennate hairs at sides of segments 3 and 4. Anal cerci long. Wings (Pl. 3, fig. 2) light brownish with axillary angle a little less than 90°. Hind femora pennate above and below, longer below. Hind tibia equally pennate above and below. Hind metatarsus not pennate. Middle femora pennate below. Middle tibia pennate above and below.

Length: 6 mm.

Rhamphomyia minytus Walker

(Text-figs 13, 14)

Rhamphomyia minytus Walker, 1849 : 502. Holotype ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*).

Rhamphomyia minutus Walker [error]; Johnson, 1910 : 760.

The holotype ♂ is in fair condition, is of the subgenus *Pararhamphomyia* and runs to *minytus* in Coquillett's (1895) key. Barnston and Waterhouse labels are present. The genitalia and distinctive hind leg are illustrated (Text-figs 13 & 14).

Rhamphomyia phemius Walker

(Pl. 3, fig. 3; Text-fig. 12)

Rhamphomyia phemius Walker, 1849 : 500. LECTOTYPE ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated.

Rhamphomyia anaxo Walker, 1849 : 500. LECTOTYPE ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated. **Syn. n.**

These specimens are referable to *Pararhamphomyia* and a pair (♂ ♀) stands over each name; the males of each species are designated lectotypes. All the specimens bear Barnston and Waterhouse labels.

Although described on the same page *phemius* was described first and the types of *phemius* are also in better condition. The illustrations given here are of the ♂ *anaxo* as I had already dissected and illustrated this specimen before the synonymy was discovered. The female is not conspecific (see below).

In Coquillett's (1895) key the males run to couplet 75, which includes *piligeronis* Coquillett and *leucoptera* Loew, but it clearly belongs to neither. The female *phemius* runs out correctly, but does not appear to warrant the description 'legs bearing long bristles'.

The following redescription mentions only major taxonomic characters relevant to Coquillett's (1895) key.

♂ Blackish species. Eyes touching above. Thorax black, dusted greyish with three dark stripes under lines of bristles; acrostichals biserial, as long as dorsocentrals; dorsocentrals irregularly bi-triserial, ending uniserial and strong. Abdomen dull, black, dusted greyish and with black hairs. Genitalia as illustrated (Text-fig. 12). Wings (Pl. 3, fig. 3) greyish with brown stigma. Anal vein distinct only on distal third. Halteres yellow. Legs dark, brown, with slender ventrals.

♀ Resembling in male in colour of thorax and abdomen, but bristles and hairs shorter. Wings faintly brownish tinged, halteres yellow. Anal vein faint about middle, but distinct right to wing margin. Legs without pennate hairs; distinct posterodorsals on front tibiae and antero- and posterodorsal bristles on middle and hind tibiae, but none twice as long as their respective tibia is deep.

Length: 4 mm.

The female standing over *anaxo* does not appear to be conspecific as can be seen from the following redescription.

Thorax lightly dusted, subshining, pleurae greyish dusted. Abdomen shining, only lightly dusted except for last 4 segments, which are heavily dusted. Wings (Pl. 3, fig. 4) faintly brownish tinged, anal vein faint basally, but distinct on more than apical half. Halteres yellow. Legs brown, shining and without pennate hairs.

Length: 3.5 mm.

Rhamphomyia tristis Walker

Rhamphomyia tristis Walker, 1857 : 148. ♀, 'United States' (*W. W. Saunders*).

There is no specimen labelled or identifiable as this species in the BMNH collection. There is no evidence that the type is in Oxford as has been shown for some other Walker species coming from *W. W. Saunders*' collection (Smith & Taylor, 1964).

For convenience Walker's description is repeated here.

'Foem.—Nigra thorace cinereo vittis duabus nigris, alis limpidis, venis nigris, halteribus albis.

'Female.—Black; thorax with cinereous tomentum, which is interrupted by two black stripes; wings limpid, veins black; halteres white.

'Length of body 2 lines; of the wings 4 lines.'

Subfamily CLINOCERINAE

Trichoclinocera longipes (Walker) comb. n.

(Pl. 3, fig. 5)

Heliodromia longipes Walker, 1849 : 504. [No sex given.] Holotype ♀, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*).

There is one female in quite good condition standing over this name and bearing a Barnston label. The face and jowls are coalescent beneath the eyes and vein r_1 is hairy above, which with other characters places the species in *Trichoclinocera* Collin (1941 : 237) and not *Clinocera* subgenus *Hydrodromia* as indicated by Melander (1928; in Stone *et al.*, 1965).

In Melander's (1928) key the species runs out to *Wiedemannia* (*Chamaedipsia*) *gubernans* Melander, described from British Columbia.

The following brief description of Walker's type indicates the affinity of the two species with reference to Melander's key characters.

♀ Face unicolorous greyish except for dark tubercle with carinate lower margin. Thorax olive-brown above, without distinct stripes, greyish below. Acrostichal bristles absent. Two scutellar bristles (broken off but sockets obvious). Wings (Pl. 3, fig. 5) greyish with veins not undulating and without stigma. Vein r_1 hairy above; only two submarginal cells, i.e. no cross-vein joining r_4 to r_{2+3} . Discal cell about equal to second posterior cell. Halteres black. Legs entirely black. Front femora with 2 short black anterior bristles distally and a series of antero-ventral bristles. There is no anterior preapical comb of tiny bristles.

W. gubernans was described as having no scutellar bristles, with the wings faintly clouded. Melander did not mention the wing stigma, but his inclusion of the species in the subgenus *Chamaedipsia* indicated that it should be elongate and faint.

Through the kindness of Dr Lloyd Knutson I have been able to examine the type of *W. gubernans* and it is certainly not a *Trichoclinocera*. It has two scutellar bristles, the wing is without bristles on vein r_1 , the stigma is elongate and faint and there are faint clouds over the base of the cubital fork and the end of the discal cell.

Other Nearctic species now correctly placed in *Trichoclinocera* (see Sabrosky, 1967) are: *Clinocera dolicheretma* Melander, *C. brunnipennis* Melander, *Wiedemannia hamifera* Melander, *W. ctenistes* Melander and *W. minor* Melander.

Subfamily HEMERODROMIINAE

Metachela albipes (Walker)

(Text-fig. 15)

Hemerodromia albipes Walker, 1849 : 505. LECTOTYPE ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated.

There are four specimens standing over *albipes*. A male and a female bear Barnston labels; of these the male, covered in glue, after soaking in KOH proved to be a *Metachela* conforming with Walker's description. The female of this pair is very badly damaged, but appears to be conspecific. The other two specimens, a male and a female, lack data. Of this pair, the male is in fact *Neoplasta scapularis* Loew, but the female is in reasonable condition and is a *Metachela* conforming to Walker's description.

I designate the data-bearing male as lectotype.

The male genitalia (Text-fig. 15) appear to conform with Melander's (1947) interpretation of the species. Melander (1928) first placed the species in *Metachela*.

Subfamily TACHYDROMIINAE

Tachypeza portaecola (Walker)

(Text-fig. 16)

Tachydromia portaecola Walker, 1849 : 506. Holotype ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*).

Melander (1902 : 227) regarded this as a distinct species, but later (1928 : 276) doubtfully listed it as a synonym of his own *T. corticalis*. However, Walker's holotype ♂ has no black spots on the front femora and cannot therefore be conspecific. It bears a Waterhouse label.

The mesopleurae of *T. portaeicola* are shining and the palpi, legs and halteres are brownish and the antennae dark brownish. The wings are brownish with unequal basal cells. The genitalia are illustrated (Text-fig. 16).

Length: 3 mm.

Tachypeza postica (Walker)

(Pl. 3, fig. 6)

Tachydromia postica Walker, 1857 : 149. [No sex given.] Holotype ♀, 'United States' (W. W. Saunders).

The holotype female bears Saunders, Walker's handwritten 'postica' and printed '68.4' accession labels.

In his key to Nearctic *Tachypeza* Melander (1928 : 274) described the wings of *T. postica* as uniformly grey and the tibiae of uniform colour. The Walker specimen differs as follows.

♀ Wings (Pl. 3, fig. 6) are pale at base and the legs are yellow with the hind femur darkened anteriorly and posteriorly and the hind tibia brownish.

Length: 3 mm.

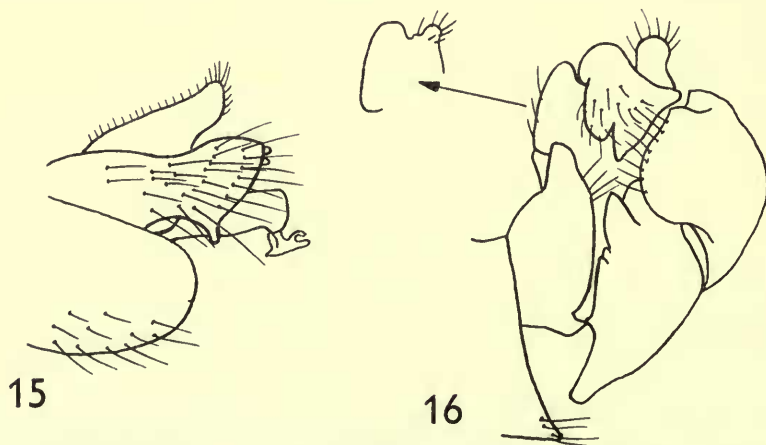
Tachypeza fenestrata (Say)

Sicus fenestrata Say, 1823 : 95.

Tachydromia similis Walker 1849 : 506. Holotype ♀, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (G. Barnston).

In 1902 (under *Tachydromia*, p. 228) Melander regarded *T. fenestrata* (Say) (1823 : 95) and *T. similis* Walker as distinct species, but later (1928 : 276-7) synonymized them. Walker's holotype ♀ is in poor condition and bears Barnston and Waterhouse labels.

The front femur is dark brown on the posterior face, the hind femur is entirely dark brown, the front tibia is entirely dark brown and the hind tibia is blackish on about the distal one-fifth.



FIGS 15-16. Male genitalia. 15, *Metachela albipes*, lectotype. 16, *Tachypeza portaeicola*, holotype.

Length: 4 mm.

Dr Lloyd Knutson has kindly checked that females of *T. fenestrata* (Say) agree with this redescription, thus confirming the synonymy.

***Ischnomyia albicosta* (Walker) (Anthomyzidae)**

?*Diastata albicosta* Walker, 1849 : 1113. Holotype ♂, no locality (*Entomological Club*) (not located).

Tachydromia vittipennis Walker, 1857 : 149. [No sex given.] Holotype ♂, 'United States' (*W. W. Saunders*). **Syn. n.**

Ischnomyia vittula Loew, 1863 : 325.

Ischnomyia vittata Loew [error], Curran, 1934 : 330.

The type of *Tachyzepe vittipennis* is not an Empid at all, but an acalyptrate of the family Anthomyzidae determined by Mr B. H. Cogan as a ♀ *Ischnomyia albicosta* (Walker, 1849) (= *vittula* Loew). The holotype bears Saunders and Walker labels and a printed accession label '68.4'. The type of *albicosta* Walker has not been located; the synonymy with *vittula* Loew follows the Nearctic Catalogue.

***Tachydromia maculipennis* Walker**

Tachydromia maculipennis Walker, 1849 : 507. Holotype ♂, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*).

Tachyzepe pusilla Loew, 1864 : 87.

[*Phoneutisca bimaculata* Loew *sensu* Melander 1902 : 204. Misidentification.]

All that remains of the type is two legs in a blob of gum, which indicate only that it is a *Tachydromia* Meigen.

Walker's description is as follows:—

'Nigra, antennis nigris, pedicis piceis, alis sublimpidis, fusco bimaculatis basi albis.

'Body black, shining: eyes piceous: feelers and mouth black: legs piceous: wings nearly colourless, white at the base, each with a large brown spot on the fore border at two-thirds of the length from the base; wing ribs and veins piceous, the latter yellow towards the base. Length of the body $1\frac{3}{4}$ line; of the wings $1\frac{1}{2}$ line.'

***Platypalpus alexippus* Walker**

Platypalpus alexippus Walker, 1849 : 510. [No sex given.] LECTOTYPE ♀, CANADA: St. Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*), here designated.

Two specimens bearing Barnston and Waterhouse labels stand over this name, but they clearly belong to different species. One specimen, a female, has entirely yellow legs and is designated lectotype. The other specimen lacks an abdomen but has broad dark pre-apical bands around the middle and hind femora and appears to be related to *P. pilatus* Melander.

P. alexippus appears related to *P. crassifemoris* Fitch.

The antennae are dark with third segment broad and triangular and a little shorter than arista. Thorax dusted. Abdomen only very lightly dusted. Legs yellow, with the mid-tibial spur short.

Length: 2 mm.

The lectotype is rather clumsily gummed to a piece of card, but would probably be in reasonable condition if carefully soaked off.

Platypalpus vicarius Walker

Platypalpus vicarius Walker, 1857 : 148. ♀, 'United States' (*W. W. Saunders*).

The type of this species is not present in the collection. Melander included it in his earlier key (1902), but omitted it in his *Genera Insectorum* volume (1928). In the keys cited and in the key of Coquillett (1895) the character of the subequal legs [femora] is used, obviously based on Walker's description, which is repeated here for what it is worth.

'Foem.—Niger, nitens, pedibus testaceis gracilibus subaequalibus, alis limpidis, venis testaceis.

'Female.—Black, shining; legs testaceous, slender, nearly equal in size; wings limpid, veins testaceous, externo-medial veins very slightly curved. Length of body 1 line; of the wings 3 lines.'

ACKNOWLEDGEMENTS

I thank Dr Lloyd V. Knutson for his kindness in answering my queries on Melander types, for loans and exchanges of Nearctic Empididae; and Mr J. V. Brown for his careful preparation of the wing photographs of this old, fragile and often dirty material.

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